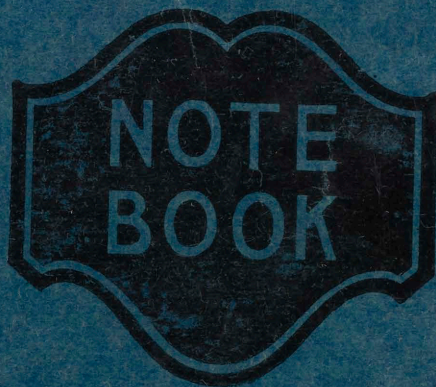


The  
**SPIRAL**



**No. 41**



Made Under One or More of The Following  
U. S. Patents 2188680-2051477-1985776  
and Other U. S. Patents Issued

~~Feather~~  
Feather

Gail Hathaway  
Army Engs

Ray Linsley

Weather Bureau

↓ Winifred Moore

Dr Meinger Geol. Survey

Dr Landermeier

Soil Conserv.

Dr Thornthwaite

Soil Conserv.

Dr Fleming

Wimmer at Matthes

" " Smiths

—

Agenda

Washington D.C.

Long dist. 211

Donald - Office  
Repub. 7500 Ext. 2250

Donald Wisc. 5508

Cosmos Club Natl 0302

Donald's home 4504 Fairfield Dr.  
Donald Bethesda, Md.

Saturday June 2.

Walter Langbein will  
prepare Title and Author  
Index of hydrology articles  
in Trans. a. S. U. for  
post war work.  
ask Walter Nilson.

appoint Com. on Hydrology  
Regions.

Thornthwaite, Bernard,  
Kenzel (Jacobs), Hoyt ( ),  
Beaver, Vischer, Ken Roberts  
etc

Exec. Comm.

New member S. W. Lohman.

Cont. on Physics of Soil  
Moisture.

Report. and letter  
from Izard. Add  
highway sections with  
new members to committee  
Winter coming West  
with Turkish delegation.  
Will perhaps meet Dr.  
Veihmeyer.

Hydrologic Regions.

Print Tables cut by Dr.  
Horton and Atlas.  
Also minutes + papers at  
Round Table.

Ken Roberts has my copy  
of Horton's Report.

Chairman Intersoc. Relations  
Horner, Johnson or  
Hoyt. Com. on Atmosphere.

Annual Letter

Amendment to Statutes  
ask Hoyt to act as alternate  
Send notice and amendment  
to him.

Columbia remove normals  
from Ray Lindsay.

Walter Nelson re Bibliog.

Beij re Bibliog. of Amer Hyd.

Paracutin Volcano.

Dr Jaudermilk will  
go to Mexico to study  
erosion and prepare  
for continued observation  
as project of Com. on  
Erosion of A.G.U.

Write Dr Fuller } Engel  
Yale Club, } Arnold  
50 Vanderbilt, N.Y. City.

Tree House

Send set of views and  
MS to Nick Bosta.

Phone John

54 Sanford Pl.  
Jersey City.

Wire Winifred.

addresses -

Francis Wether

3900 Connecticut Ave

apt 303 G

Merrill Bernard

5517 Glenwood Rd

Bethesda, Md.

EM-6373.

Gail Hathaway

Dr. Richard E. Fuller

Care Mayflower Hotel

Wash. D.C.

or care Yale Club

50 Vanderbilt

New York City.

Dr. Lowdermilk

Repub. 4142 Ext. 5101

Hayt. RE/ 1820  
S. Int. Bldg 7244

Linsley Mich 3200

Soil Conserv Re 4142  
Thamthwait

Library of Cong.  
NAT 2722

W. G. Hoyt

Land Utilization

S. Interior Bldg 7244

Rep. 1820

M. B. Smith, Admin. Asst

Dr Fleming

Woodley 8538

Monday 9:15. 5200<sup>+</sup>

Broad Branch Road.

10 am. State Dept

Mrs Shapley Trans. Div.

Mr Reed asst "

Bring photos and teleg.

J. W. Green

107 E. Bradley Lane

for photos.

Retired from magnetism.

In 1939 started on S. Pac.

Scientific Cruise - But was



Fedocov

Leonov

Soviet Embassy

Mr. Granin Sec. Secretary

"urgent" of Embassy.

Passport with photos  
for visa.

Be sure re cost.

"via Teheran \$2500."

says Mr. Kennison of  
Nat. Research or Nat. Acad.

Penicillin

from Nick Costa.

June 15-28-

Mr. Nanson in

Mr. W. Leish's office

Virginia James  
for the notes.

---

At 4 pm Mrs Harris's  
Trees,

At 9 am at Laboratory  
to meet Mr Smith

---

Details from Consul Guy  
New York City.

---

Consult

Dr Fleming

9 Thornthwaite

re Soil Hathaway

Ray Linsley -

Normals

Hayt - Notice of meeting -  
re Statutes

Dorothy Carroll

New York City:

Home Gr(amery) 5-7917

Office TR 5-1391

(Langbein)

— To be Done —

Committee on Hydrologic Regions.

Thornthwaite, Bernard,  
Menzel ( ), Hayt, Vischer,  
Kenneth Roberts, Gail Hathaway

Consult when return from  
Moscow.

Committee on Bibliography.

ask Beij.

author-title-subject Index  
all articles on hydrology  
in A. G. U. Transactions.

Langbein and Wilson.

Committee on Parícutin Volcano  
Dr. Londermilk.

Frequent visits, long project.  
Coop. with Mexico.

Hoyt as proxy at Exec. Comm.  
A. S. U. June 16.

From Dr Field:

Story of Special Fleming Fund.  
Tribute to Dr Fleming and  
ideals.

Significance of Bowie Medal.

Regional Meetings of A. S. U.  
Tennessee Valley  
New England

Annual Letter.

Send pictures of Tree House  
and MS to Nick Bosta.

Follow Passengers

arrived 7 am

Dr. Kellogg of U.S.D.A.

Sandwich

Alexander

{ Nat Wilkes  
Dorothy Cornell

9:30 am

Harvard Club

27 - W. 44

On C 54

Stevensville  
on St George's Bay  
arm of Gulf of St Lawrence

9 hrs to Agassiz 1 1/2 hrs stop  
9,000 ft trip to Agassiz

Dep. 12:20 pm. (2:20 pm)

Buckings.  
Lakes Snow  
Bumps  
Ride near, cowboy!

Wed - June 13 -

Leaved 3:30 am

Katydid, breakfast  
off at dawn (5 am)

Morning over Sea.

class.  
Great Bitter Lake.

Anchor clouds.

Scenes of Arabian Fairy Tales  
The magic carpet.

Into fleecy clouds rivaling  
delicacy of fleece - plucked  
asunder

Down red caught by  
drums of propellers

Sand ridges like sastruzgi  
or snow erosion

Trams

We pass over Dead Sea  
Jericho, Bagdad

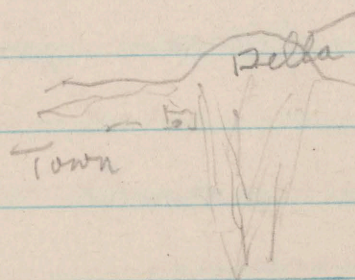
[~~Shadows of Pyramid~~]

a sea of cloud like  
ice pans over the sea

Mt Sinai - range?

Shore line

Olds over sea + land



Surf along the shore  
("ice" fringe) -

Behind sand dunes

in Dry farming of area -

Roads, boundaries, farm  
patterns

All streams + roads lead  
to Gaza

A hill town.

Rounded hilltops. Forests -

Terraces

Greens, browns, colored

Soil -

Over Hebron - large hill  
city -

Old crops and contours

Bottom - Jerusalem  
in same view.

Rothschild's  
chemical iron

Dead Sea -  
1300 ft below sea level

looks like Salt Lake  
No Death Valley here.

Jordan a triangle in  
an ~~or~~ but mt valley.  
Jericho at base of cliffs  
Trans. Jordan

A great agric. pattern  
in colors - Arab or Jew?

Amman - Capital of Trans. J.  
Roman Theater & ruins

⊙ an air marker

Desert now for 2 hours  
Talk on economics of  
fertilizers

Ry from Damascus to  
Baghdad. So straight, so quickly  
~~fast~~ <sup>deviating a bit</sup>

Altitude Flight  
E at odd numbers  
5000, 7000 to 9000  
W at even numbers  
4000, 6000, 8000

Planes below us speeding  
west.

like studying canals of Mesopotamia  
"a lava country for 20 mi"  
craters worn down  
dry -

a complete desert -  
a cloudless sky -



Euphrates in desert,

A land pattern on  
"dry" drainage leading  
into it.

Green broad ribbon  
into Northwest,

More railroads.  
Great <sup>fade</sup> green lakes -  
and another - Canal into  
them

6 hydroplanes on  
lake below.

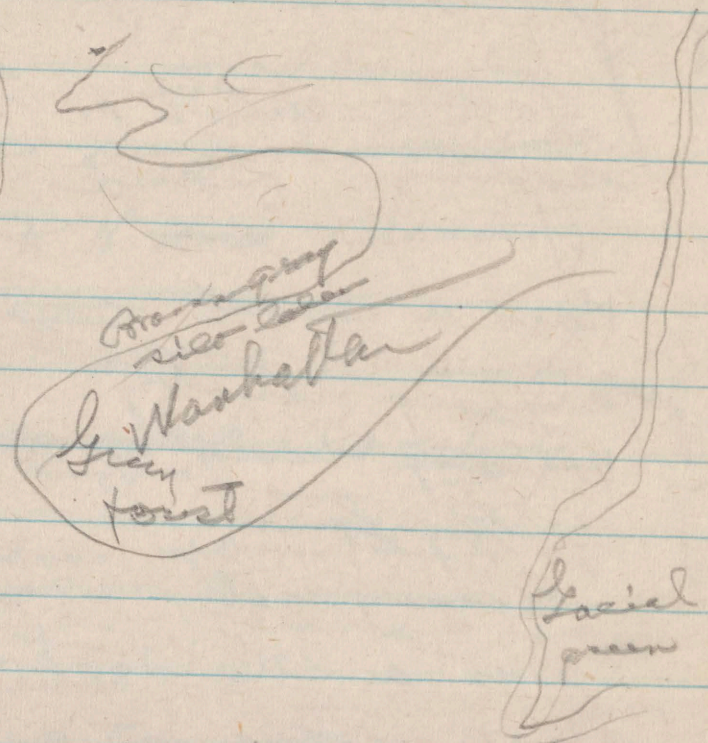
Euphrates silt laden  
Broad green patterns  
<sup>only</sup> if irrig. system were  
restored

a great irig. area  
even now.

"Between the Rivers"  
Euphr. To SW - Fig 2. E

Agric. all the space between  
Bagdad below

8:45 am  
Cairo time



Desert again + dust  
storm

In 1911 irig plan  
brought up. Enough for  
500000 (British) and  
2000000 (Italian)

11  
Babylon 60 mi below

Heaven  
2/3 day

Mineral ? upstream

Wide ditch or road  
system sand covered

2 hrs flying  
Paw, Shuf

Now a great sandless  
farming country.

Winding lining systems (ditches)  
A tiny town.

Stapley with very fero:

"Just a little too much,

D don't have it all in"

a continuous great  
savanna,

Mountains - parallel ranges

ahead - Two long thread  
streams west-

Chocolate - alabaster

graded land below

dry - sparse timber,

getting colder

Flying 12,500 feet

great longitudinal  
valleys with broad  
green irrigated fields,  
snow to N and ahead.

long streams from passes  
a snow fed country,

Green mountain tops  
Brush or grass - trees  
Ravines  
Assabad - town center

To S, a snow clad range,

Tusk-i-puk Mts,

~~Ravistan~~

Rushtican - South part  
of Iran, few foreigners  
permitted

Snow ribbons below  
Trees far up canyons  
Terraces, zigzag roads  
over ridge to another  
valley.

A great wide plain  
Agric. <sup>Trans-Himalayan</sup> railroads, <sup>Hammadan</sup>

"A vast plateau  
700 x 1400 miles  
mostly desert with sand  
streams. But large  
green areas.

A winding stream, two  
long straight ditches.

"Snow first asset.  
Always ask "What was  
the snowfall underground  
led water 4000 years ago"  
Pope.

Elburz Mts far ahead,  
Snow covered. Need  
snow surveys here.

"1000 views mainly  
of architecture but  
some of landscape.  
Ask Aunt for a for her  
Pope

No lawns in towns -  
Compounds - but green  
around.

Elburz 18000 ft. dead  
ahead.

"Ride her cowboy" - You  
want a Westerner if  
you can't.

A grazing land  
Green

a great irrig.  
valley. much in green  
patterns. Winding streams  
bottom lands, Canals  
in multitude -  
are markholes  
(repair-holes) for  
repairing underground  
water ducts.

Mts close to north are  
snow tipped.

Teheran -

A midwestern town  
Concrete runway.

Ambulance on side line  
"meat wagon" they call  
it.

The Eastern Crescent,  
June 14 Teheran 70000  
at home - Clean

Night on the desert.  
Quiet. a slammed door.  
An explosion. a yell.  
Out at 3 am Cool air.

Twinkling lights - 1000 ft <sup>high</sup>  
Merade except the caravan  
of 20 camels.

The Persian Pyramid at  
sunrise 18700 ft high  
to east.  
North the Elburz - Cataract.

2 propeller planes

Smith & Mc Bain in the front

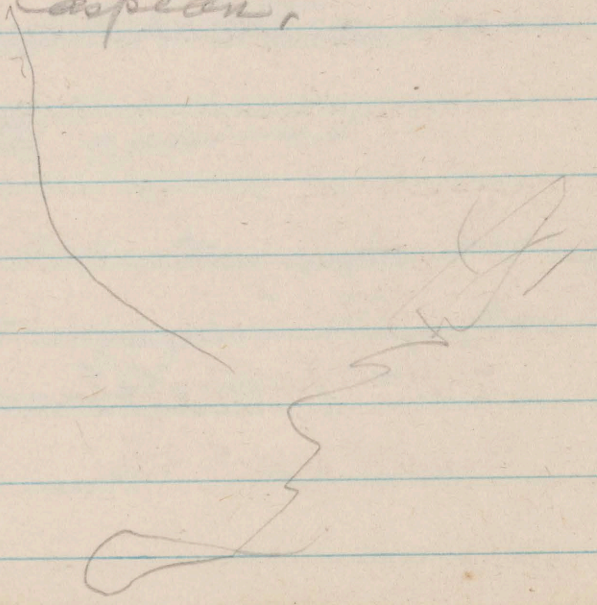
Sheep, antelope  
ground!

Snow Surveying  
Would I come?  
Yes, or send one.  
Stream gaging & surveys

Close view of spring - and  
underground conduits.

Over the mts. A Barren -  
In the pass - a sea  
of anchor clouds.  
Mountains tops project  
from clouds.

The Caspian!



Bogs or lakes  
like an estuary.

The clouds thin to  
individuals. Over the  
shimmering waters  
cloud shadows upon its  
Limitless. Water sky +  
mirror form one horizon.  
Clouds in north look  
like icebergs.

Over a sea of cloud -

- 1. Larger fleeces to fleeces iceberg size
- 2. curls or small fleeces
- 3. Water.

Stratification

Plane level with topmast.

Most delicate plucked flocks  
Strange, need procession  
of lower cloud stratum

Damn -

Masts of ships? Oil  
devices in the water

of the Caspian, and  
land also. Oil pools.

10 times Buxenfeld.

A city - an academy.

Dry - built in 20 yrs

landed on dirt field.

a girl with red flag is  
traffic director.

Breakfast for all our  
guests - Eetings from  
pres. of academy - young  
men, eager rather than

stately - " their new  
country."

Customs -

Colloagues - English &

Sindhu.

Knows Kashmiran Sira  
and the dam - Can tell  
me more.

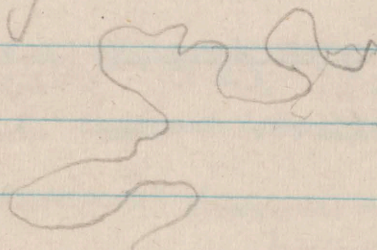
Up Caspian

quiet sailing here  
High into west

Chris long - Caucasus.

Then the winding

Volga.



Around their  
plants.

Typical delta  
stream.

From beyond Moscow.

Rough. In thin cells  
jerres and springs up.  
But not below.

Some former from  
tank - suggest monitoring

Kohloff has hyperthy  
but will not have  
sulfa.

Inland for Stalingrad  
flat as a floor.

~~Kohloff has discontary~~

Flying to the tops  
of the cumulus - to avoid  
jerres -

Now cutting thru cloud  
tops. Vision into  
vapour caverns.

Now just scraping the  
old bases.

Land like Morocco.

Rained. Stream like  
octopus tentacles. green  
widening into broad streams  
where dammed.

Land below beyond streams  
greenish brown or brown

The great <sup>brown</sup> Volga and  
Volga island -  
Stalingrad on

ring. ditto

a great city, desolate  
& brown with green  
stream bottoms & terrace  
culture around it.

Colored soils. Streams  
eroded.

Dung pits everywhere  
without pattern. Shell pits?

Here the Soviets fought  
with backs to a great  
barrier stream.

The agric. pattern is  
in large areas. The  
stream beds are greener  
but a flush of green  
shows on the flat land  
between.

The shadow of the  
plane has the apparent  
diam. of a lead pencil, or a *pen*

The Don! Not so large  
as Volga by far, "yes, it's with  
Shapley. Project to send  
Volga water in Don for  
land above Black Sea.

Went to sleep -  
awoke to find hayforest  
plantations, green  
fields, better laid out  
communities, poor walls  
from shells.



Leningrad

lost 10000 by bombs  
but fully 1000000 by hunger

Letland

500000 perished

Academy visited all the Swedes  
personally.

Had in prison

Paisky

Botalkin

Sherman

wish to meet me

Tell Sherman  
Forecasting snow  
Prof. Velikánov

Corresponding member

(interested in snows and water)

Prof. Sterólnikov

(interested in water and irrigation)

Mrs. Padoucheva

Name?

Dr. Ahlmann

Prof. Soha

India

Albmann's Manuscript  
sent to R. Geogr. Society for  
publishing in Geogr. Journal:

Summary of Glacial Investigations  
round the Northernmost part  
of the Atlantic in 1918-40

- 1) The districts investigated
- 2) The accumulation
- 3) The ablation
- 4) The regime
- 5) The firm limit
- 6) The rate of movement
- 7) The recession and shrinkage
- 8) Classification of glaciers Morphological  
Dynamical  
Geophysical
- 9) The meteorological causes of  
the present day recession of  
the glaciers.

The lecture at R. Geogr. Soc. planned  
for Nov. about the same as the  
article

Received the Patron's Medal  
of the Royal Geog. Soc. in  
1939 and was honorary  
member in 1940.

Academics receive  
about 5000 rubles.

- Guides -

Her husband in Berkeley  
Moscow. Bolshaja Poljanka,  
44. op. 18.

Lambrova.

Moscow. Zozotnikovskij  
7 op. 34

Savinova. Euginy  
(my Leningrad soldier girl)

## State Farms

10% workers remain

more than 20 years

70% more than 15 years

5000 state farms in  
Soviet

275 workers

200 families approx.

500 children "

2500 acres

## Forest-Field Farm

## Collective Farm

280 families (working people 320)

273 hectares under cultivation

$$273 \times 2.5 = 680(?)$$

Each family has extra 100 sq. meters  
Co

Hotbed cultivation

46 people work on the two  
hotbeds. Others on seed

culture.

65 hectares for apple orchard

Farmer may build + own  
house and 2500 sq. meters  
can sell or be traded.

Tractor man gets twice  
as much as laborer.

Norway

92 children under 7 years  
under care during day for  
working mothers -

Aver 7 yrs go to school

Earth fats for resetting  
plants -

Outside toilets. Wells but  
screened,

Foundation of happiness.

Dr Ahlmann feels that they  
may not be persistent.

10  
Norwegian Ambassador  
has written re. Inter-  
Govt. Committee meeting -  
Belland-Hansen well

Division of Cultural Relations  
Page

## Reports for Oslo:

- 1) Constructions of snow layers for high a long duration.
- 2) Physico-mechanical property of <sup>the</sup> snow.

International Conference  
on Snow at Moscow  
in spring of 1946.

Mechanization of snow

Katelin, World Snow  
Year.

25 Kms per sq. Cm

Russian "one wheel's"

Mrs Merrill Bernard

2205 42<sup>nd</sup> St. N.Y.  
Emerson 6373



Bardin, First Vice  
Pres. of Academy  
Metallurgist

Mr. Nadari, applied Mechanics  
Steam turbines  
— etc.

L'Orignal / Sperensky  
Institute Indians / Naval  
Pencil top / in San Francisco

Inc. / razor blades  
shirts

Note book

Suitcase

Campfire phenique

— Mineral oil Indians

Press suit

Mend slipper

Post cards

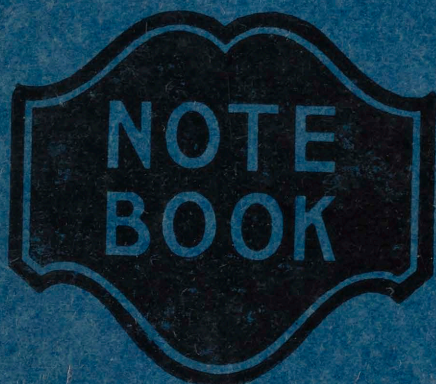
Barry sheets

Capt. Aukens, Billet "1"  
would like to meet  
Dr. Pope. 6 or 7 pm

Dr. C. knows more about snow  
than even God himself. — "Kedain."  
"Greatest living authority on snow"  
Kedain.

- 1945 -

The RUSSIA  
**SPIRAL**



No. 41



Made Under One or More of The Following  
U. S. Patents 2188680-2051477-1985776  
and Other U. S. Patents Issued

Dark Glasses.

Ri Andrea

5 Ave and 54<sup>th</sup>.

Weyrowitz

630 Fifth Ave

4<sup>th</sup> Floor

Passport Bureau

1 day.

Up at 3 am

Thru deserted New York

Search - kindly but chaotic

Flying suits

Rain

Off - South winds 5hr to

lakes below - <sup>Keppelland</sup>

Clouds - 5000 ft - ears -

Rugged clouds succeed  
over my

air more luminous

Ruth wants signatures

- Distance -

New York - Azores	2400 mi	
Azores - Algiers	1600	
Algiers - Cairo	1300	
Cairo - Basra	1050	
Basra - Moscow	1825	Total
		8175

Moscow - Novosibirsk	1800	
Novosibirsk - Irkutsk	1100	
Irkutsk - Yakutsk	1150	
Yakutsk - Fairbanks	2400	
Fairbanks - New York	<u>3400</u>	Total
		9850

New York to New York 18,025 mi

Plane -

C54A - (Cunard)

8175  
9850  
 18025

articles to be prepared by  
Checotillo for aqa + Snow.

1. Ice Storage Houses
2. Protecting Moscow Reservoir  
by flooding ice with grill of pipes  
and building up the thickensers against  
bombs. Preventing thawing until August  
by covering of fir boughs.
3. Building frozen ramparts without  
water by using water impregnated  
clay and loam as binder.
4. Snow storage houses for food.
5. Snow-barracks for soldiers.  
Received war medal for his  
ice and snow defence of Moscow.

Carman  
(Hungarian)  
at suggestion in Dub.  
at Cal. Tech.

Carman

Commission of Snow etc

<sup>Director</sup>  
Dr. V.A. Obrucher, Institute of  
Frozen Ground

A.M. Checotillo, Vice Director  
Institute of Frozen Ground

N.A. Tsitovich, Director  
Laboratory of Frozen Ground  
(Soils mechanics)

Gavila Dmitrievitch Richter  
(Physics of Snow)

No / Gen. Federov, Director  
Hydro-Meteorological Service

S.E. Frolov  
(Climate) ?

Prof. N.N. Zubov, Director  
Institute of Oceanography

Academ. Grigoriev  
Direct Inst of Geography

B. Binnikov, Director  
Arctic Service  
Papanov

Krylov M.M. Ice houses

Prof. Velikanov  
(Forecasting from ice)



Physico-Technical Institute

Limits of Speed on  
Ice

Speed and vibration  
of equal made resonances

Meas. made under  
shell fire on Nevada

Published in Journal  
of Technical Physics -  
(Institute of Tech Physics)

Leningrad 21

To The Physic-  
Technical Institute

P. Kobelko.

↑ strains on ice.

Sokolovs ky D. L.  
Doctor of technical  
Sciences

Leningrad  
Tolmazuov per.  
5 W. 28

Runoff charts from Rain  
and Snow in U. S. S. R.

L. Kabinovitch Translator.  
State Hydrological Institute  
Desires Bull. 23- Snow.

Amer. - Russian Hydrolog.  
Dictionary  
in preparation  
by her.

Prof. Liakhnitsay  
Leningrad *Hydrologiya*  
Institute  
Vassilievskiy Ostrov  
Vtoraya Liniya, 2  
Room 23

Nizhni-Novgorod  
Institute of Road  
Transport

Prof. Zoubov (Зубов)  
Chief of Institute of  
Oceanography  
Moscow,

Tomorrow after breakfast

Oleg Spengler  
Leningrad, Vasilii Ostrov  
2 line 23

State Hydrological Institute  
Study of snow  
(maps).

Depth, N. Equiv., Density for  
forecasting of runoff.

Actual forecasting plans  
is in Forecasting Institute  
at Moscow.

(Central Institute of Forecasting  
of Moscow)

Pres. Kominov:

"It is more important that  
we be true Stalinites,

Without our country Stalin  
could have done nothing  
without Stalin our country  
would have been the  
victim of the enemy.

Therefore we are  
"insuperable"

Gettysburg

"Glory  
to the defenders  
of Leningrad"

Simple, but better so.

Backward view of  
desolation: Ruined dome  
amid stark trees & view of  
distant city.

Ruins (Roman) with  
peasants among them

Admiral Prof. Zuev.

Guseva  
Guseva, Marine <sup>al(?)</sup> Semé-  
nova. Moscow. B. Ka-  
luzhskaya d. 19.

Kafedra Zan-Evrop. Jaz

([on opposite side of  
Presidium])

Chair of <sup>West European</sup> ~~Foreign~~ Languages  
of the academy of Sciences  
of U.S.S.R.

Geophysical Observatory  
Kalitin

Prof. Wiese Chief of the Scientific  
Commission of the Arctic  
Institute. V.U.

Buinitzky, Chief of the  
State Arctic Institute.

Central Geophysical Observatory

For article see Aluminum

actinometry Prof. Kalitin.

Micro-climate

Climatology

Origin of changes in  
climate.

Range of observations 70 to 200 feet

100 years in 1949 -

Abandoned by Germans only  
on day of retreat.

used magnetic observ. for

gem displacements,  
change in climate and  
retreat of forests?

Chief of Central  
Geophysical Observatory  
Leningrad.

Geoph. Observ.  
State Hydrol. Inst.  
Furzev, W. Kozlov

Central

Hydro-Met.  
Service  
(Moscow)

So write Moscow.

Send Evap. Study.

Bydin F.J.

at home | Leningrad 25  
Marat street 17  
KW 5

Office | Leningrad 2  
Halturin street  
Lenenergo

Chief of Hydrological Inst  
major Ureevaeff  
assistant chief for Scientific  
Work major Rosvich.

---

649.9 Km Leningrad  $\Delta$   
Moscow

To Paskal(?) 82.5 Km



Methods  
and Removal of  
of Packing the Snow  
in airdomes in U.S.S.R.  
during the War.

June 29 - 42

29/VI - Москва

Научно-исследовательский  
Аэродромная станция  
Военно-Воздушных сил  
г. Балашиха Москва

Scientific Research  
~~Station~~ Airport station  
of Military-Air Forces

БАЛАШИХА МОСКВА  
НИАС

BALASHIKHA MOSCOW  
NIAS

E-1-29-42

ГОРБУНОВА ХАРЬКОВ

- aviation -

Institute of  
Научно-исследовательское  
Аэродромная станция  
Военно-Воздушных сил Красной  
Армии.

Москва. Балашиха  
НИАС ВВС КА

начальник

инженер-подполковник

(Харьков) Сарыков В. ? Chief of Institute  
начальник сейсмической

старш. тех. лейт Горбунов

инженер

Тельман

инженер

Зелачик

тел. E-1-29-42

Москва

Балашиха

NIAS W.VS. KA

left No 23  
for them

Military Air Service

Principal chief of Institute

Will prepare papers for  
Oslo on making airfields  
from snow.

Coming to U.S.A. in July  
or August.

Germans used 1000  
prisoners to pack airfields

July - Rather heavy rain,  
July 2, 1945

Monday

Up at 3:30 am Leave ground  
at 6:20 am

"I must kiss you" - I gave  
her a piece of candy, all hugh,  
Then I race ashore for  
another hug and kiss.  
I wish I could bring her  
with me.

Rain last night. Sky dry  
this morning but cloudy.

Moscow lies below in  
a green landscape.  
Moscow River canal.

Houses on the highway,  
farms behind.

Above floory clouds  
floating over the landscape,  
but under stratus.  
Soon over a sea  
of cloud with the stratus

canopy growing ever  
nearer. The two seem  
to be merging and  
visibility is a horizontal  
crack.

Now neither sea  
nor sky - but only for  
a moment. The green  
again appears, then  
tossing in a smother  
of white.

Visibility lengths of  
wings. Altitude 1700 m.

9:05 am

Green! Towers, river,  
fields. Then or under  
billowy clouds. Sun  
breaking thru ceiling above.

The Volga - winding S.  $\frac{1}{2}$   
Forests  $\frac{1}{10}$  to  $\frac{3}{4}$  of the  
area. Trees edge the  
river courses, <sup>and look</sup> like frost  
ferns.

Streams from forest  
areas - Rain or snowed?

Riding at the tips of the  
cumuli.

Cumulo-cirrus above.  
Finally into the sun.

Cumuli look like icebergs  
on the sea. Some are  
still above us, Altitude 2700 m.

Icebergs of the air!  
but spreading upward  
with fingers and lobes.

Forests make tapestry  
patterns

First stop to be at  
Anassie on <sup>Irtysch</sup> River - 2 pm  
Altitude 3500 m.,  $26^{\circ}$ F.

Kazan on Volga. Have  
we passed it?

Even the brown fields  
have a cast of green.

a large river, settlement  
reservoirs & dams

11:09 - Over a large  
city. Bumped descending  
thru clouds. A large lake,  
Sverdlovsk! Beyond  
the Urals without knowing  
it. In Asia!

No stop. Cruising over  
farm lands at 5500 m.  
Green carpets. Cultivated  
plots. a great plain,  
Endless distance.

Timber 1/5 -

a railroad N to S.

Water in soil - bogs  
and waterholes frequent.

But land between  
cultivated. Much water  
in forests. Trees  
around water holes  
and in stream beds.

Sun reflected by water  
like a mirror.

Warmer now. at 3500 m.  
the men were beginning to  
put on flying suits.

25 round lakes in view  
at one time.

Water and forests. and <sup>short</sup> green,  
Is this last grazing land?  
Glaciated land?

No visible connecting  
streams.

Cloud ceiling (stratus)  
high up but more  
toward horizon.

More lakes. A feeder  
stream for last. Subsurface  
flow?

Soil seems drier now.

37 lakes and 1 large one  
Is this land glaciated?  
Kellogg doubts it.

Murk closing in. Will  
it rain?

Patches of trees suggest  
a lake origin. Subsurface  
water in pockets.

Some cultivation in  
selected openings.

Increase in plots.  
Larger plots.  
Near Omsk.

---

The departure of the delegates  
from one hub:

English, <sup>Iranians,</sup> French, Swedes,  
Hungarians, Americans.

So many routes &  
scenes. Many pilots.

---

Railroad - 30 cars.

Hubs of much traveled  
roads.

Our first stream,  
Very large cultivated plots  
or rather areas.

Our river! The Irtysh<sup>2</sup>  
Big city - 2 pm, 2 bridges,  
an elevator. 6 stony buildings  
cottages.

Trip 8 hrs.

Piles of logs.

Down - 2:15 bumped.

---

On a turf landing field!

No radio aboard.

Travel by touch.

40 min. for dinner.

On to Novo-Sibirsk -

2 hrs 40 min.

The Irtysh flows into  
the Ob.

a boat canal at Omsk.

Rain but some clear  
sky.

Cultivation not so ex-

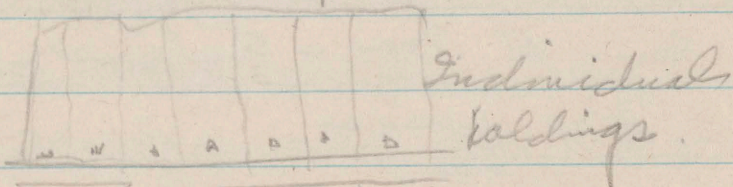
tensive but good.  
Wheat or rye in harvest,  
or high.

Towns with long back  
yards -

Railroad -  
a tiny forest fire has left  
trees scorched.

Forests in tiny clumps.  
Due to ground water?

Collective farm communities



Farm beyond.

Going E. Shadow of

Jungon.

Some notes on  
the construction  
of ice-dams in the  
extreme north of  
the USSR.

"Hydrotechnical Construction"  
p. 34 W 7-8. 1938.

Great head.  
Park. Large city.  
Trees stand out like  
palms at Cairo.



Tensive but good.

*[Faint, mostly illegible handwriting on a piece of paper pasted onto the left page. Some words like "the", "of", "north", "the", "with", "us" are visible.]*

in beyond,

Going E. Shadow of  
Tail is on our ring.

Cattle.

Towns - Shadows

long

5:15 pm. Another large

farming area.

Railroad - roads

flats.

Train 65 cars and

helper engine.

Brilliant rainbows

Rainbow  
travels  
with us <sup>(plane)</sup>

Great river ahead.

Park. Large city.

Trees stand out like  
palms at Cairo.

Spiraling over city  
for landing.

River banks somewhat  
deep cut, & eroded.

Turf floor again.  
Evergreens - Drainage.

Landed

Moscow time 5:45 pm

Siberian time 9:45 pm

4 hrs difference.

Depart at 1 am Moscow  
time or 5 am Sib,  
time.

So wash up + To bed

Banquet - Dinner  
(New Siberian town)

Novosibirsk 1930 - 80,000

1945 - 900,000 - (Fifty years

War factories ago.  
at this table were 1 family-  
fisherman

Ambassador Davies,  
Malstar, Eric Johnson  
American CPC.

Interned planes were Tokes  
never kept here,

"Could not derive the  
scientists", Twilight  
outside

Wendell Wilkie came thru  
here

1930 - 25,000 Kwatts,

1945 - 250,000 Kwatts,

1930 - no theater

1945 - 7 theaters  
(7,000 capacity)

1930 - no education sci  
institution,

1945 - 11 now

Midnight trip to sea city

Spacious setting for indoor buildings -

Institute of Architecture + Medicine

Opera House - Prize winner but Germans did not believe

Russian engineers could build it. Constructed during war 1800 - Great Station

Crystal chandeliers of modern type. 1000 employees -

Low dome type. Remains type of decoration with oak paneling.

Broad exits, large foyers.

Railroad Station

12000 - 50 trains

Daily. On Trans Siberian

On the Ob River.

Wooded hills

Public square ground collected by German

Concrete runway to take off

By. Necessary for children enroute even with mothers under trained nurse.

Power from coal. Some very good. On Ob River but wide & shallow. Too expensive for power plant for so small a city.

City only needs grass and pavement.

Try Anara on Ob R.

Temp. 1 - Min -49° F

Snow Nov 15 - Depth 1 meter.

July 3 Tues. 6 am

3 hrs sleep.

Heading into the sun.

Fog in winding channel of the Ob. Trains in distance on Trans. Sibir. might almost be Humboldt R.

Country hillier. River systems forming. Buttes

Passing from Ob into  
Yenisei Basin and on into  
Lena Basin to Kirensk,  
Prob. thence down Lena to  
Yakutsk.

Yenisei Basin  
Old fragments of  
river channels grown green

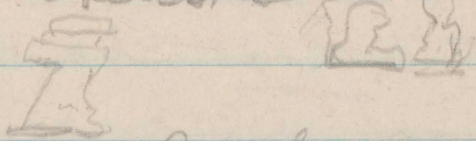
Forest land  $\frac{1}{2}$

Altitude 3150 m.

Ice on inside of windows  
Lungs feel strained,  
Between two cloud  
strata.

Agriculture plots  
increasing. Down stream

Cloud obelisks



a sea of cloud with  
cloud bergs floating about  
in it.

Altitude 3150 m.  
Continuous sea of  
clouds. Thru gap  
saw Yenisei turn  
north. Broad  
~~level~~ Tunguska R.?  
Diving down thru cloud  
to 2100 m. like diving  
into the sea.

Cloud canopy 1000 m. thick.  
Floating cumuli below.

Landscape  $\frac{7}{8}$  forest,  
Drainage NW.

Still diving - 750 m.  
Long stream flowing N.

Forest  $\frac{1}{2}$  dense.

More long narrow  
winding streams.

Fragmentary channels  
water filled, cut off from  
present continuous channel.

Lena R-

a very broad river  
from far south  
tending N. of E.  
forests of Birch and  
larch?

agricultural land  
in river bottom - a broad  
center.

a large town - Kirensk

Kirensk

On an island in the  
river. Some Mongols  
here.

Stom at Yakutsk. So  
held over here for better  
weather ahead; tho sunny  
here.

Pines, birch, grass,  
wild flowers, white water  
lilies - Foot bridge.

July 5 4 B. to boat  
next to last stop in boat

Stay in tiny village in  
the country. Wandered  
in forest. Slept.  
Blonde hostess.

Wednesday, July 4

start 5:22 a.m.

Fog on lowlands -

Mail guards in

Put maps and flyover suits  
mixed.

Meeting the sun. Anchor  
clouds over the Lena  
flat land.

Mts to south, snow  
floored.

To Yakutsk 5 hrs  
Miss Marina.

Rising into clouds  
2700 m.

Kirensk granted privilege  
of reopening its church  
but voted against it.

Elev. 2769 m. upper  
cloud canopy still above  
no  
tight ceiling above, to right  
mountain range with  
two butterfly-like snow  
remnants.

Below the "blue sky" filled  
with cloud resembling  
white markings in  
arctic ice, a sky upturned  
or rather upside down.

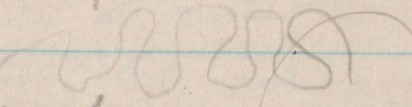
Waves of fleecy clouds now  
lie ahead.

Over the mountains  
clouds in the canyons,  
snow remnants on the  
lips.

Clear sky ahead except  
some thin cirrus - stratus  
and clear landscape beneath

Snow on a river bank,  
Lena R. again? Have cut across  
fleet of 5 barges and tug.  
agric. on bank,  
N. of Lake Baikal.

Side stream of Lena

  
has sharp banks whose  
N. faces are white with snow,  
looks like long snow  
serpent. Forest are  
wholly green. No trace  
of snow,  
large islands <sup>and sandbags</sup> in big river,  
green fields. Boats, towns  
a large agric. area, roads.  
Oleminsk? a large tributary  
flotilla of 10 boats, <sup>Oleminsk R.</sup> Aldan Mts low.  
Traveling without tickets  
2/3 to Yakutsk. 8:30 am

## Maps

Far-East War-Map 25¢  
"From Siberia to Australia"

Geographia Map Co.

11 John St  
New York City

Big river to right. This  
must be the Lena.

Bumping hard, one big  
cumulus near by.

An enormous river!  
Steamer. City. Flag staff

Auto. Lumber mill  
& log. Sloughs.

Barges at bank.

Sand. Pumping.

Curving. Landing.

10:15 am. 5 hrs, exact

Turning back?  
Over forests. Puddles into  
it. a great curve-  
down into forests -

Toward city to Russian  
log inn. Must rest till 8 pm  
to let storm clear ahead.

Now only 16 hrs to Fairbanks  
and two July 4's at date line.

Running water - Pet cubber,  
sleeps in birch trees.

Log house typical and best  
Forests for wood, logs warm.  
Big brick stoves. Rugs. Double  
windows.

Soil dry - Steppes - Tobacco!  
90°F. Pumping?

Bilingual - Outer Mongolia -  
autonomous.

Jeeps (Russian "Willys"), oil trucks  
"U.S. Air Service". Peas. Lend-  
lease. Rice (near Japan + China)

Dinner -

Toasts - My host insisted on a tiny glass for me tho he let me have also my glass of "Lena River water" He toasted us "scientists to everlasting peace".

Ked the bear. Hostess played tag with him.  
90,000 inhabitants per square

8pm Off from the sunset  
Host signed a 10-Ruble note to me, and I got the "Academy of Sciences" signatures on a 3-ruble note for him. He was delighted.

Over countless lakes in every size and stage of desiccation.

Farms among them,  
4 forest fires in one area,  
5 in another. Clearing land,

1 hr. thru high mists or fog. Still lakes but also small rivers.

Up Aldan River across Nerchogorsk and Gordajinsky Mts.

an almost straight highway along left bank of river

altitude 3600 m

9:35 pm Sharp mts -

5 parallel ranges.

Deep canyon. Some snow-glacier remnant or ice or snow?

Trees to top. Parallel ranges but complex.

Over the tops - Snow in canyons and in floor of large canyons. Much erosion all canyons V-shape.

Young host member of Soviet Red Army



Altitude 2,700 m.

Mts now  $\frac{1}{2}$  snow covered  
Rock strata horizontal  
as at Lake Louise,

Air quiet. If day, air  
"would be as rough  
as the devil",

Snowed streams. Cornices  
but under 24-hr sun  
most of snow will disappear.  
→ Place for snow surveying

Probably 3 or 4 small  
glaciers. Moraines dirty.

Old glaciated slopes  
Crests rounded, pocket  
lakes everywhere as  
in High Sierra.

Everywhere braided  
streams - Erosion

If only color views  
of entire trip.

10:25 pm Snow left behind.  
Landscape lower but still  
rough.

Silk stocking 4 Rubles 20 Kps.  
| by ticket, but 300 Rubles  
in free or open market.  
To prevent black market  
& inflation, spend extra cash.  
Road again.

Large braided stream  
running SW.

10:30 pm

More snow-capped mts ahead

Old caps on snow-capped  
mts - Chilled by night.  
A long series of large  
lakes <sup>at base</sup>. Still 2650 m.  
2 possible glaciers.

Into the storm, Rough  
sailing. Mts below.

We can't go lower.

Can { barely } see ground  
    { or dimly }

Streams N & NW.

Sunset - sunrise,

Stretched out like a  
river or "lane of fire" a good  
quarter circle in length.

12 Midnight July 5

Out of storm into thin  
mist. Lighter, details visible.

Mts, snow patches, braided  
streams.

Altitude 2850 mi. Up steadily.  
3100 mi.

Crescent moon

✓ Sun rising

Crescent  
moon

→ Plane going S of E?  
Going to Tokyo?

July 9 - Total solar eclipse.

High mts ahead - alt. 3250  
3400 m. In top of clouds on  
crests of ranges.

The glory red of sunrise!  
Pink in east.

Circling - a great river  
below us. "Coming down like  
hell," a long highway -  
alt. 2000 m.

Kolyma R. Seimchan?  
Picturesque river scene.

Bluff on one side of  
stream. Boats - (clay-gravel)  
Dam to have surfaced  
field - Air Port just under  
construction.

On direct route to Fairbanks,  
Passports inspected.  
Gassed up. Chased  
mosquitoes.

Up to meet the sun, not  
yet visible at surface of earth.

Next stop Nome?

River of several channels, blind channels, dead channels - Water bogs. Evolution of stream pathways

2 am  
Sunrise - trailing vapors. Double rainbow <sup>(one brilliant)</sup> below in E and traveling with us. Tundra <sup>+ forests</sup> resplendent in soft light.

Stream bed a tapestry pattern of channels. Water soaked,

N. toward Bering Strait.

Mts everywhere but low mountains in troughs but peaks <sup>+ ridges</sup> seem barren.

Braided streams from mt peaks. Broad snow banks.

Cold. Putting on clothes, alt 3900 m.

Some high mt masses snow capped. a mountain country.

3140<sup>am</sup> Over a sea of white.

Next stop Mosokov reached by river and road from Bering Strait.

alt. 3250 m.

Like flying over Arctic sea ice with blue-water leads and a low cloud ceiling overhead.

Head resting?

Down to 2400 m.

Try to look down thru Rainbow - Rivers? Braided streams  
Town - airplanes, circling.

faces, rivers, bogs, Getting under the scud

Town! Airfield. Two rows of planes

This river has been  
much higher. All sand bars  
wet.

Landed on steel mats,  
More planes than I have  
seen at least since Mesam  
New Town. Part of air  
transport service?

Captain took us to  
breakfast.

Time 3 hrs advanced,  
6:45 to 9:45 am  
Total 8 -

Passports inspected,  
receipts for money brought  
into Russia taken up,

Dogs & dogs.

Up again. Over a sea  
of cloud and under  
a high canopy of  
placulent clouds

at 3950 m.

Sea of cloud ended  
large lakes on part of  
Pacific Ocean.

Then barren mts with  
snow cirques and frozen  
lake. Silt streams

More frozen lakes. ~~But~~  
most lakes unfrozen.  
Long thread-like streams,  
from the snow banks,

The cirques are mainly  
cornice remnants.

Clear sky above and  
below.

The lakes and the  
wet surface of the streams  
and mts become momentary  
mirrors as we pass  
over and shimmer  
and dazzle.

Ice a head of one fjord

Some green in the river bottoms approaching the sea.

The ocean lies before long peninsulas, headlands, a fjord, a tiny island, The blue sea

Steep mts to the shore except below. There tiny lakes shine like molten silver. Snow banks in lakes.

1:05 pm, Out over Strait Snow on very beach. Water shimmers. Land's end a sharp point. Sky almost cloudless.

Date line

Turn clock back to July 4 until tonight 12 o'clock.

Two ice floes seen in Strait. Try for sleds at next ice due to other mts.

Starting  
Beginning shore to  
view of Alaska

clouds stretch out from Alaska like a field of fluffy ice with contours like a coast line. It seems even to rest on the shimmering sea.

Long bars and tails of cirrus fan overhead.

The shimmering water shows thru the veil.

2:10 pm Off Nome?

Island and steamers mountains on north.

Over Alaska - Shore-line road\* Lagoon. Buildings. \*Or is it beach? Now a path or road.

Nome left behind?

Norton Inlet? 50 houses, Sand terraces beneath sea.

Two towering cloud  
mountains ahead, Will we  
see Mt M<sup>c</sup> Kinley?

Inland over the clouds,  
Warmer over the sea.  
It seems cold here,

Out of the belt of  
clouds over a broad  
tundra valley - Laxes  
as E of Urals - Bog, Water,  
clouds arose in gigantic  
masses locally

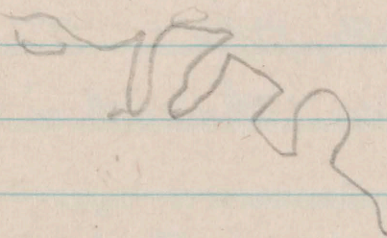
Out of bog over mts  
with long streams.

Other immense clouds  
ahead toward Mt M<sup>c</sup> K.

Clds 20,000 ft high.  
Plane 2950 m. high.

Meandering river -  
Remarkable loops  
and Laxes.

a highway N to S.  
Forests 30%, almost to  
tops of mts.  
Rainbow.



Land of Labyrinthian Rivers  
Brown stream, perfect  
curves, detached curves  
waterfilled, detached curves  
dry and grown up. Patterns  
and colors like tapestry.  
Pothole Laxes,

A great plain ahead.  
Shadow of tail again  
on wing.

Warmer - just over 2000 m.  
More heat provided.

a "fairy carpet" - a  
cloud castle floating in  
the sky.

Mt McKinley 125 mi. away  
plainly visible. Top cut  
off by a cloud -

High mts -

To far right Mt McKinley  
towers far up and next  
Mt Foraker at S. end  
of plain. A high white  
range extends to the  
far east -

The brown Yukon  
and Tanana(?) spread  
over the plain.

Some radio towers  
& roads. Our journey  
ends 5:30 pm. On time  
as usual.

Green but not greatly  
agricultural.

Town - Boats in river,

The "bus" is finally warm.  
How comfortable.

July 5 again -

An immense port.

The potential air base for  
Asia.

Major Ryan - Some experience  
with ice - Mastadon.

"For what guys?"

Letter to Marine - via N.Y. -

Have again advanced  
my watch 3 hrs. = 12 hrs.  
total from Moscow.

Out at 2:30 pm

Touched by arthritis.

English seems strange.

People can understand me.

Russian still sounds natural.

Fear I'm an internationalist.

Trip with my boy and  
a second pit 50 or so  
yards  
west

ski course on hill

To Part at 1:30 pm

Dr. Innis and companion  
leave us - Take commercial  
plane in morning.

We are being taken to  
Minneapolis. From there must  
purchase tickets. Govt can  
do no more. unless new  
order should be sent.

a larger plane - red tail  
and wing tips. Otherwise  
silver - The silver wing  
dazzles the eye at the window.

Runway nearly 2 miles long.  
We could not use it all up  
in landing yesterday.

off at 2:30 pm. Edmonton  
at 4 am with 3 hr advance  
in time. First stop White Horse

Hot meal on board 45¢.

agric. Looked again.

a field outside of Fairbairn  
+ some gardens in town 5,000  
pop. Tundra being removed  
for roads.

Alcan Highway along  
our route. Gravel  
pits at half-mile  
intervals - High range  
Mt Hays etc to south  
paralleling our course.

Tenana River(?) below  
is fed by side streams  
from range.

Landing straps again.

Into a continued thunder  
storm. All view cut out.

Cruising speed 160 mi.

Plane leaps and swishes



like a racehorse. Stream  
in plane, noticeable.

Over mountains. Rivers  
less braided -

Finally out of storm  
but galloping still.  
a long lake. Green  
areas, forests. Snow-  
capped peaks - Flight  
at 10,000 ft.

### Whitehorse

Like Montana - a large  
town on the river, two  
steam boats. An beach  
above town a large  
twin airfield by concession  
by Canada.

Head of navigation  
on the Yukon, a railroad  
to Skagway.

a chain of lakes from

- TVA - Set-up -

Neil Bass, <sup>\*</sup>Consult. Engineer.

Jay, Hydraulic Eng.  
of Stream Control.

\* Water control on the land.  
Reforestation, erosion  
control.

J. C. W<sup>c</sup> Amis  
Agric. (Thun Colleg. +  
Exp. Stations).

20000 - 30000 decon-  
struction farms.

↑ Chilcoat Pass to Whitehorse.  
Really river lakes.

The Alcan Highway follows  
them. The coast chain  
stretches endlessly SE - snow  
covered. This is the  
inland route into inner  
Alaska. So easy after entry

from Snagway.

We are cutting over the lower mountains & lakes to Fort Nelson and Edmonton.

Are the braided streams ceasing.

Clear sky 90%

Over a nest of sharp mts snow flecked. A bit of mountaineering for the Alcan that must cross them from the lakes to the Mackenzie basin.

Three fast places passed by. Another was seen deep below us.

9:15 pm

Finished full two-way dinner with many vegetables on board.

Shadows growing long. Shadow of tail on wing.

Snow, but lakes, reflecting sky and clouds. Rivers winding but no longer braided. Why? No erosion? Gorges. Where is Alcan?

Yes, over the hills to the south, down to a wide river - a station on the bank, a ferry?

Lost it again. I thrill if there is something to discover.

Yes, again the Alcan is winding over the hills, to south. To Fort Nelson?

The coast range is getting ever farther away.

The Alcan disappeared climbing a steep ravine toward a bare summit.

The depths are now

dim - I shall probably  
not see it again -

No snow & build that  
highway -

The red sunset is  
on our right as we  
we are traveling S.E.

Today (July 5) weighed 150 lbs  
Gained? at least haven't  
lost weight.

10:15 pm

Onto the flat lands + small  
lakes -

Red lights ahead. Fort  
Nelson.

Again set watch 1 hr  
ahead. Good forest. Highway  
almost dark.

New time 11:15 pm

Several Soviet planes

## Search & Rescue

Nome - Fairbanks 536 mi

Fairbanks - Whitehorse 492

Whitehorse - Ft Nelson 452

Ft Nelson - Edmonton 538

### I. Equipment Available

A. Aircraft on skis, floats,  
and wheels

B. Tractors equipped  
for travel over snow

C. Air to ground radio  
equipment

D. Emergency drop - kits

E. Sled and pack of  
beans.

T.S. - A TC white star 

Soviet Red Star

Silver planes to mark them  
visible when fallen.

Oliver drab like Soviet  
almost invisible in trees.

Leave 11:45 pm  
Still some twilight.

Million Dollar Valley  
3 planes downed by storm  
& forced landing. None  
injured, but only passengers  
and instruments rescued.  
Another crashed 4 mi. from  
port.

Others have never been  
found, esp. one with  
16 high priority passengers.

No beacons along way,  
but an arrowhead pointer  
(a cubical triangle) set with  
green-red lights shows  
the direction of the wind  
for landing.

Lights (green-yellow-green)  
in top of wing as warning  
to planes flying above.

This plane hoisted near  
the floor. Overcast not  
necessary tonight.

Yes, I see a beacon flashing -  
Do they begin only at Ft. Nelson?  
a year or so ago, are there now?  
/ am. July 6

Dark. Yes, another beacon.  
3 pm. The dawn on left is  
pink.

2:45 am. Two lights on our  
starboard. A lake.  
Another large lake.

This craft leaps waves  
than a destroyer, on a  
choppy sea. The tail  
fairly spins and the  
floor is tin and sloping.  
3 pm a long line of lights  
on port bow just beyond the  
pink of the dawn.

Edmonton - Put a clock  
ahead 1 hr. to 4 am  
a bonus of 3 hours between  
Fairbanks and Edmonton.

So only 1 pm. Therefore  
we have lost little sleep  
and gained a night.

a great city by the lights

In NE the crescent  
moon and Venus in  
the crimson morning glow.

Ham Mountain Time -

Only two hours change to  
New York City -

Edmonton 110,000 -

all courtesies

Dr Heiman gave me coffee  
and lunch!

Arrive N.Y. tomorrow early.

Beautiful farm country +  
soil - wheat.

Farther away forests and  
grazing land.

1 pt milk 5¢

Lakes large and numerous,  
fog over water.

Fields amid lakes and  
forests remind of Russia.

Glaciated country?

The Saskatchewan R.  
running N. Regina soon  
a long angle lake.

Land patterns pleasant,  
all land under cultivation.

Regina! <sup>9 am</sup> Airport ~~for~~ <sup>per</sup> ~~variant~~  
and attractive. Canadian for  
Trans-Canadian Airline.

Only brief stop. Speeding  
for Minneapolis and N.Y. tonight.

Timothy 15" tall. Fields  
becoming yellow.

Plane is using the last  
two runways to the very  
end.

"In N. Dakota" - Kellogg.

Many catholes, all full of  
water. Plentiful moisture.

Not so green as Saskatchewan.

Devil's Lake? Railroad.

"Red River Valley" - "Old Lake  
Agassiz."

Raining at 5000 ft. altitude

Section roads very prominent with patterns of green within towns on diagonal railroad.

## Over Minnesota

State of lakes and smaller and more diversified farm and boy roads. Forest plantations and park-like lakes and villages.

Bumping thru storm clouds. 6 go to N.Y.

Radio sent ahead.

Approaching Minns. at 1 pm  
Has the pilot speeded up?

A great city with lakes in its midst

Going to General AirPort,

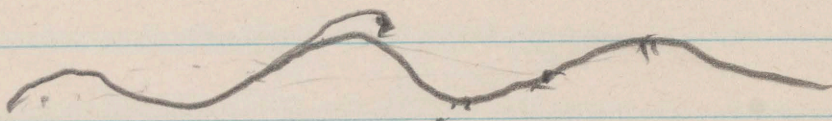
The Miss canal and

St. Anthony Falls?

Strand's -

Dr. Keenan wants a report to include his his.

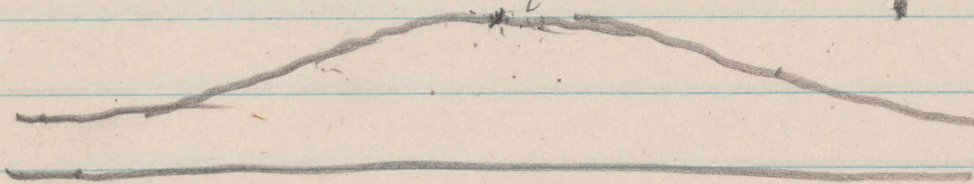
Analytical + physical chemist



$$\frac{v}{w} = \sqrt{\lambda}$$

$$v_g = \frac{1}{2} v_w$$

$$\rightarrow \frac{1}{2}$$



$$\begin{array}{r} 30 \\ 5 \overline{) 270} \\ \underline{54} \\ 30 \\ \underline{30} \\ 0 \end{array}$$